

Sanctuary

MODERN GREEN HOMES

ISSUE
58

SMALL CHANGE
SPECIAL

Tiny Tassie treasure; latest eco-concrete options;
making space work harder; urban microforests

When less is more

Homes going small on
size, site and budget,
but big on heart



PUBLISHED BY **renew.**
AUTUMN 2022 • AU/NZ \$13.95
SANCTUARY.RENEW.ORG.AU

ISSN 1833-1416



9 771833 141017



One of 24 Residential Efficiency Scorecard
assessments valued at \$400 each

Offer open to Australian residents. Details page 85



Inside issue 58

HOUSE PROFILES

We visit amazing eco-home projects that are modest in size, cost or footprint, or cleverly fit on tiny blocks – and sometimes all of the above.

16 Tiny treasure

Jiri Lev's diminutive family cottage in northern Tasmania uses locally sourced, natural and raw materials and is a blueprint for affordable housing.

22 Small by design

Josie and Brendon's off-grid house in central Victoria is deliberately small, simple and sustainable.

28 Fitting the bill

In subtropical Rockhampton, this family are enjoying their sustainable, low-maintenance home built on a tight budget.

34 Modest masterpiece

Simple, prefabricated construction and careful design enabled a spacious-feeling and high-performing home on a seriously tiny Perth site.

40 Compact and crafted

Taking cues from Japanese architecture, Condon Scott Architects crafted a compact small-footprint home in Wanaka, New Zealand.

44 You little beauty

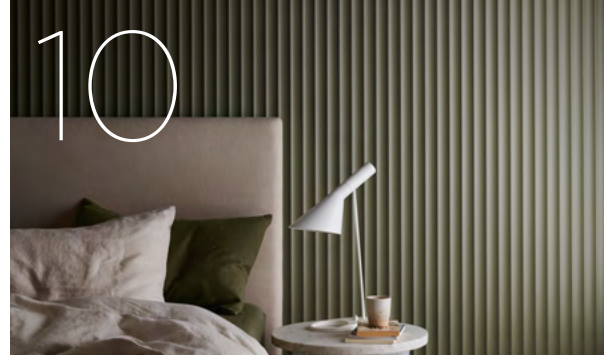
With a footprint of just 35 square metres, this renovated terrace in Sydney's inner west provides a light and quiet sanctuary with leafy outlooks.

49 Super sharehouse

After visiting many uninspiring apartments, Brisbane first home buyer Hugo Salmon found a house just waiting for a transformation and a new life.

54 Smaller, simpler, smarter

For his new family home near Margaret River, one designer aimed for maximum flexibility, natural materials and a passive income stream – all while downsizing.



IDEAS & ADVICE

60 The rising cost of building

What does it cost to build a house in Australia these days? What factors are at play, and what's the most affordable way? We talk to three experts.

64 Sustainability in the mix

Concrete is a beloved building material with a shockingly high embodied carbon footprint. Dick Clarke brings us the latest in eco-concrete alternatives.

68 Eco-concrete case studies

Cement replacement, geopolymers, concrete and recycled components: these three homeowners made a greener choice for their concrete slabs.

71 Join, act, impact

Renew's network of volunteer branches provides an avenue for people to take practical action in their local community to address the global climate emergency.

74 Pathway to carbon zero

In *On the drawing board*, the team at Positive Footprints tells the story behind their Carbon Zero Homes series.

80 Design Workshop

Small space expert Kate Shepherd helps a young Canberra couple make the most of their diminutive but beloved apartment.

86 Pocket forests

Mara Ripani explores the world of urban microforests, often no bigger than a tennis court.

REGULARS

8 Subscribe

10 Products

14 Reviews

91 Renew update

92 Campaign update

94 Marketplace

96 Designers in profile

PRODUCTS



Recycled plastic workshop

Precious Plastic Melbourne is a family-owned social enterprise working towards a circular economy for plastic waste. They assist businesses to prototype and manufacture their own products, sell moulds and specialised plastic recycling machines for use on projects by community groups and schools, and experiment with making their own recycled plastic products. Check their website for products such as carabiners, soap containers and hair accessories, as well as beautiful ocean-inspired artworks by resident artist Kayla Mossuto, constructed entirely from post-consumer reclaimed plastic. Artworks start at \$490, and smaller items just a few dollars.

www.plastic.org.au

Zero-VOC paint

It's sensible to minimise the volatile organic compounds (VOCs) in your home, for health and environmental reasons, and your choice of paints and finishes is a good place to start. There are many low-VOC paint options these days, but even better is the small but growing range of zero-VOC paints on the market, such as the paints from Ecolour. Their paints have been certified under Good Environmental Choice Australia's (GECA) Paints and Coatings standard, with no VOCs and a carbon neutral status. The paints also make use of recycled and refined waste engine oil, which acts as a preservative to maintain durability and smooth application. The paints are water-based, can be tinted to any colour, and are suitable for a range of interior and exterior applications. The Eco-Living Interior wall paint starts at \$39 per litre or \$193 for 10 litres.

www.ecolour.com.au



Low maintenance wall panelling

Looking for something a little different for your walls? Wall lining panels can be applied straight to plasterboard, timber, steel or brick, adding character to a room, covering up uneven surfaces, and maybe adding a fraction more insulation to the home. Laminex has developed a range of easy-to-install wall panels in a range of profiles, including some with a retro batten look featuring straight-edged grooves, as well as a scallop design. The Surround by Laminex panels are manufactured locally from a very low formaldehyde medium-density fibre board (MDF) comprised of plantation timber and waste wood fibre, and are easy to mount as a DIY project with their tongue-and-groove installation system. The panels are very durable, but they are not suited to wet areas. Prices start at \$76.50 for a 1200mm x 2400mm lining panel.

www.laminex.com.au

BOOKS



Never Too Small

Colin Chee, Joel Beath & Elizabeth Price

Smith Street Books, 2021

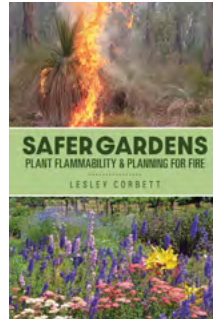
\$60

Review by Kellie Flanagan

Never Too Small: Reimagining Small Space Living showcases 30 examples of clever small-footprint dwelling design. Like the YouTube channel that preceded it, this elegant hardcover book furthers the quest for beautiful, simple and functional designs that make the most of the tricky and often unproductive spaces that abound in urban housing.

To pick just a couple of inspiring local examples, the ‘Loft Houses’ in Pyrmont, Sydney, transform unneeded off-street parking space into two 35-square-metre conjoined dwellings. Built to be completely separate from the main houses, each features a mezzanine bedroom, and light is provided to both levels using a skylight and skilful lighting design. For ‘Itinerant’, a tired ground-floor studio apartment in a 1960s Richmond block is transformed into a 29-square-metre home for the architect and his wife, using a storage wall that divides public and private areas and a main bed positioned on a plinth that doubles as housing for the kitchen plumbing.

The book espouses a commitment to using limited space flexibly, opening it up or adding structures to support multiple uses; in each case, designing it to precisely fit the way it is to be used and to avoid waste, helping city dwellers simplify their homes and make them more liveable in a changing climate. As a source of inspiration, *Never Too Small* offers readers and their architects a trove of ideas about the many ways they may use clever design to get the most out of their own tiny space – and the wealth of beautiful images and plans make for intriguing reading to anyone interested in good design.



Safer gardens

Lesley Corbett

Australian Scholarly Publishing, 2021

\$55

Review by Madeleine De Gabriele

The question of gardens and fire risk is undeniably vexed. Since the devastating 2009 bushfires, many publicly available lists of ‘low flammability’ or ‘fire safe’ plants were withdrawn – possibly in recognition that they were flawed; possibly due to a perception of legal liability; certainly in the face of the realisation that in a hot enough fire, *everything* burns.

This has left gardeners with a mass of incomplete, inconclusive and sometimes flatly incompatible advice about creating a safer garden. With this book, subtitled *Plant flammability & planning for fire*, Lesley Corbett has set out on the mammoth task of compiling and comparing the current scientific and expert advice on plant flammability across Australia, as well as garden layout and risk assessment.

The core of the book is the Plant Flammability Table, which lists more than 500 plants and notes their apparent overall flammability, the conditions under which they were tested, their presence on state fire lists and research notes. The vast majority of these entries have a small ‘i’ next to them, indicating there is more information about the plant in the middle section of the book.

The rest of the book is essentially an explanation of the methods used to create this reference table, with careful presentation and analysis of conflicting evidence. Lesley is working from a messy hodge-podge of data; as she writes, “There are no universal guidelines for what methods to use to test the flammability of plants, not even an agreed temperature for ignition tests.” She has the advantage of being an experienced amateur – she candidly admits she has no scientific background – which helps her write in a practical and vividly readable style.

Safer Gardens is a huge undertaking, both for its scope and the meticulous detail included. One gets the sense that Lesley would be very grateful to see it superseded by a more scientific work, but until that book is written, this is a careful and lucid reference book for the fire-aware gardener.

Tiny treasure

LOCATION Meander Valley, TAS • WORDS Chris Crerar • PHOTOGRAPHY Sasha Lev



At a glance

- Pared-back family living in a 26m² cottage
- Built on a tiny budget
- Almost exclusively natural, raw materials
- Open-source plans to help support housing affordability

Drawing from the area's pioneering past, Jiri Lev's diminutive family cottage in northern Tasmania uses locally sourced, natural and raw materials and is a blueprint for affordable housing for the future.

When architect Jiri Lev and his young family moved to the Meander Valley in Tasmania in 2019, it was the quiet simplicity and 'politeness' of the valley's Georgian era cottages that resonated with him.

Wanting to build a modest home that could also act as a testing ground for some of his ideas on housing solutions, Jiri tapped into that local vernacular and, like the early settlers, kept his search for building materials unpretentious and local.

Wedged between the imposing ramparts of the Great Western Tiers to the south and the Gogg Range to the north, the upper Meander Valley was a prized area of local riches – including tradeable ochre – for the Pallitorre people who called it home for at least 10,000 years prior to European settlement. Devastating

frontier conflict and subjugation of the Pallitorre handed the valley's riches to the new settlers, who were soon able to feed, clothe and house themselves largely from the lands surrounding them.

In a country where life is now enormously abundant for most, where the average new house is among the biggest in the world and where we are facing a housing supply and affordability crisis, Jiri is urging us to revisit principles of economy, necessity and thinking locally as we attempt to re-imagine Australian housing and home ownership. What Jiri hoped to demonstrate with this 26-square-metre dwelling – the first stage of what will eventually be a modest two-to-three-bedroom home – is that good design, sustainable best practice and the utilisation of non-toxic natural materials are all available to those on small budgets; it just takes some careful thought and shifting of expectations.

→

Clad in locally-sourced macrocarpa weatherboards, Jiri's family home is an exercise in small-scale simplicity.



↓

Off-grid and designed for energy efficiency and simplicity, this treechanger couple's new home in central Victoria is a delight.



Small by design

LOCATION Yapeen, VIC • WORDS Sasha Shtargot • PHOTOGRAPHY Shayne Hill

Josie and Brendon's off-grid house in central Victoria is deliberately small, simple and sustainable.

It's a sure sign of welcome in a neighbourhood when strangers leave notes in your letterbox appreciating your new house. Such was the experience of Brendon Hillermann and Josie Ryder when they moved into their new home in a rural hamlet near Castlemaine in central Victoria. "We've had really positive feedback," Brendon says. "It's awesome that people walking or driving past have such appreciation for the house."

Maybe it's the gleaming white corrugated steel exterior that stands out amid the rolling hills of the surrounding countryside, or the bold statement of sustainability the home makes with its 24 solar panels on the north-facing roof, or the fact that it's small, neatly-proportioned and proudly so. Or it may

just be a combination of all those things that captures people's imagination.

Josie and Brendon bought their half-acre block aiming for a lifestyle shift from inner-urban Melbourne. Used to living in apartments and appreciating modestly scaled spaces, they wanted to build their dream home small: "Our approach has always been to not have stuff for stuff's sake," Brendon says. "We wanted a space that suited us and having a small home means we have a smaller mortgage and a place that's easier to maintain and still really comfortable."

For their home, the couple chose Small Change Design and Construction, a Melbourne-based company dedicated to small-footprint, environmentally friendly homes. After consulting with director Sally Wills, they chose the 'Bantam' design from the ten standard designs the practice offers, slightly customised to suit their needs. The house was built by LG Builders and completed in 2020.



At a glance

- Modest sized 7.2-Star home for two
- Off-grid house with 7.9kW solar PV system and batteries
- Designed by a small home specialist
- No gas use

↓
A double-height void and built-in window seating helps give the dining area a feeling of spaciousness. Marina grew up in a house with a north-facing backyard, so this feature was a must-have for her. The extensive north-facing glazing means she never has to put the lights on during the day.



airtightness of 0.84 air changes per hour, double glazing and design to make the most of northern light and solar access, meaning no heating is required in winter. Mechanical ventilation with heat recovery, design for cross breezes and a ceiling fan in every room ensure rooms are well ventilated and cool in summer.

Marina was involved in every step of the process, working closely with Ben and the builder, Tru-Line Construction. “They included me in every decision, so now being able to live in this home that I helped create is really exciting,” she says.

5

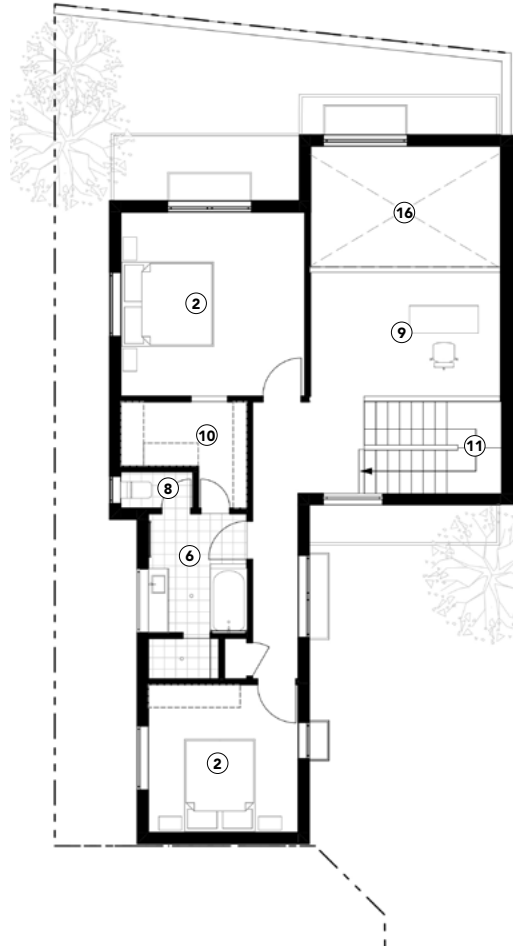
→
There is no air conditioning in the house, which is instead kept cool with the help of cross ventilation and ceiling fans.



GROUND FLOOR PLAN



FIRST FLOOR PLAN



LEGEND

- ① Entry
- ② Bedroom
- ③ Living
- ④ Kitchen
- ⑤ Dining
- ⑥ Bathroom
- ⑦ Laundry
- ⑧ Toilet
- ⑨ Study
- ⑩ Walk-in robe
- ⑪ Stairs
- ⑫ Store
- ⑬ Porch
- ⑭ Deck
- ⑮ Carport
- ⑯ Void

CAN WE AFFORD IT?

The rising cost of building in Australia

WORDS Anna Cumming



INGRID
HORNUNG



MARCELLO
BELCASTRO



SIMONE
SCHENKEL



↑

The Passive House Simone Schenkel has designed for her own family in Melbourne is underway, incorporating many cost-saving strategies. The home has a deliberately compact and simple form and makes the most of structural insulated panels (SIPs). Simone is writing a blog about the process at www.gruencodesign.com.au/news. Images: Simone Schenkel

What does it cost to build a house in Australia these days? What factors are at play, and what's the most affordable way? Late last year *Sanctuary's* editor Anna Cumming moderated a panel discussion with three expert practitioners to dig into this subject.

I have a long-standing interest in well-designed, sustainable and comfortable homes, and in my role as *Sanctuary* editor I enjoy being part of the mission to inspire and educate people about the design strategies, materials and systems available to achieve them. I'd like everyone to have access to such homes, so the cost of building is also very important to me.

We often hear from readers who love the magazine but would like to see more affordable, budget projects that are within the reasonable financial reach of more people. Of course, 'affordable' is subjective and varies hugely from person to person, but in my

work finding great sustainable homes to profile, I have noticed that the ballpark cost for the sort of project I think of as 'modest and affordable' has risen from around \$200,000 to \$400,000 or even more in the last couple of years. And I realise that because my rule of thumb is based on recently completed houses, not projects just getting underway now, it doesn't even take into account the dramatic cost rises the building industry has seen in the past year or so.

So a discussion on what it costs to build a house, what factors are at play, and how people can do it more affordably seems timely. In October last year, I spoke to three talented experts as part of Design Matters National's (DMN) InspoExpo: building designers Simone Schenkel and Ingrid Hornung, and builder and energy assessor Marcello Belcastro. The recording of our discussion is available to view via the DMN website (see link below). What follows is a brief overview of the topics we touched on, and the expertise the panellists had to offer.

SUSTAINABILITY IN THE MIX:

The latest in eco-concrete

WORDS Dick Clarke



↑
Wagners Earth Friendly Concrete was used for the downstairs slab at Daniel and Marion's renovated home in Brisbane. See the case study on page 68 for more. Image: Scott Burrows

Concrete is a beloved building material for its thermal mass benefits, versatility, strength and durability, yet comes at the cost of shockingly high embodied carbon. Happily, more environmentally friendly mixes are coming online. Experienced sustainable designer Dick Clarke looks at the problem and some of the latest solutions.

Concrete is perhaps the world's most ubiquitous building material, found almost everywhere humankind builds things. With its infinite mouldability, extremely high compressive and shear strength, and ability to be reinforced to give it massive tensile strength as well, it is an obvious choice for structures. Its resilience, even in adverse environments, is yet another reason it has stood the test of time: the earliest true concrete construction we know of is the Pantheon in Rome, built around 126CE.

Ancient concretes were made from a variety of component materials, but these days the most common manifestation is made from three basic ingredients: cement (usually Portland cement), sand and gravel aggregates, and



GEOPOLYMER CONCRETE SLAB FOR A FLOOD-RESILIENT RENOVATION

The downstairs fitout to Daniel and Marion's house in a flood-prone area of Brisbane was designed not to keep floodwater out, but to let it in and then out again without damage, through the use of materials that can be hosed down and left to dry. This includes a polished concrete slab made from Earth Friendly Concrete (EFC), a geopolymer product from Wagners. It suited the project because of its extra strength and durability – particularly handy in the event of future floods.

As a geologist, Daniel has been following the development of geopolymer concrete for a long time. “If you care about greenhouse gas emissions, then geopolymer is the way to go,” he says, explaining that it's a quite different type of concrete due to the products used to replace the typical cement-based binding process. EFC is made from a geopolymer binder that combines two recycled industrial wastes – fly ash from coal-fired electricity production and iron ore slag – mixed with aggregate to make a slab. “By replacing Portland cement entirely, the emissions reduction is around 80 to 90 per cent.”

Marion and Daniel were committed to “pushing the boundaries” with their project, which saw the first use of EFC for a residential polished concrete slab in the country. The slab was designed according to the specifications for standard Portland cement concrete, with a large amount of steel reinforcement, although Daniel questions whether that much steel is necessary with a product such as EFC due to its higher tensile strength and fewer fractures. “It will take time for engineers unfamiliar with the properties of geopolymer concrete to become comfortable enough to adapt their designs,” he says. The builder and concreters noted that the product was different to work with compared to standard concretes, with more effort required to achieve an even surface.

Daniel explains that the colour changes that accompany geopolymer during curing were unfamiliar to the polishers. Heavy polishing of the slab exposes the yet-to-be-oxidised fresh concrete, which is greenish in colour. This resolves to a more standard grey after oxidisation, around a week later. While this was initially confusing, it wasn't a significant problem. The slab has a matt finish (no oil used) in keeping with the simple finishes throughout the lower level of the house.

Daniel has barely noticed any hairline cracks in the slab and is very happy with the colour and the result. As part of his work with the Sustainable Minerals Institute at the University of Queensland, he is now working with Wagners to explore more sustainable aggregate options in order to achieve a near 100 per cent recycled concrete product, using recycled 'ore-sand' from mineral ores.

For the full story of Daniel and Marion's project, designed by JDA Co., see *Sanctuary 56*. Images: Scott Burrows

JOIN, ACT, IMPACT: Renew's branches making a difference

WORDS Jodie Lea Martire



↑
Renew Sydney West Branch convenor Jenny Dibley recognises the importance of attracting people to branch displays at public events. Guessing where the water comes from in their solar powered 'magic tap' gives members the opportunity to engage with the public. Image: Jenny Dibley

Renew's network of volunteer branches – 14 of them around the country – provides an avenue for people to take practical action in their local community to address the global climate emergency. We chat to a handful of members doing exactly that.

Sanctuary's publisher Renew has been inspiring, enabling and advocating for people to live sustainably in their homes and communities for over 40 years, and its branches have always been a vital part of that mission. Each local branch models the idea that a small group of thoughtful, committed

citizens can change the world. Branch members demonstrate sustainable building techniques, advocate for legislative and policy changes, and provide unbiased information on how we can all live greener, cleaner and more equitable lives on our finite planet. Working in their local communities, branch participants take practical action in many small and larger ways and are at the frontline of the slow, vital work of social change. As Tim Williams from the Tassie South Branch says, "If we, as a group, can offer assistance to help make positive changes in people's lives, then all the better."

Renew's branches have been changing people's lives since 1976. That year, its founding group – known as the Alternative Technology Co-operative – was born in



Image: Jarra Joseph-McGrath

OUTDOORS

Pocket forests

Urban microforests gaining ground

WORDS Mara Ripani



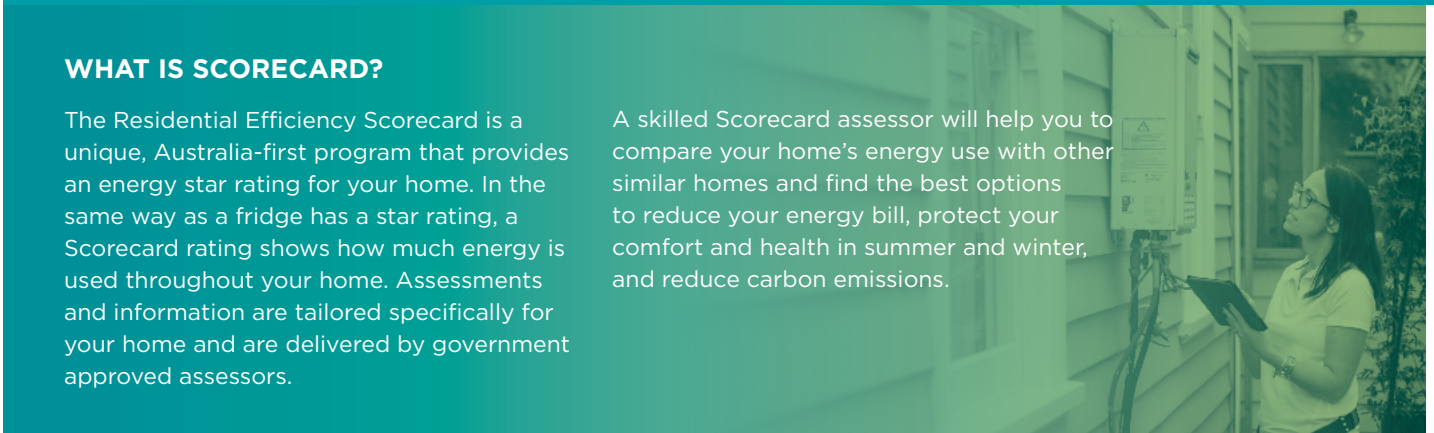
WIN one of 24 Residential Efficiency Scorecard assessments for your home, valued at \$400

Subscribe to *Sanctuary* or join *Renew* by 5pm AEDT on 15 April 2022 and go into the draw to win. Open to Australian residents. Terms and conditions apply. For full details visit renew.org.au/prize

WHAT IS SCORECARD?

The Residential Efficiency Scorecard is a unique, Australia-first program that provides an energy star rating for your home. In the same way as a fridge has a star rating, a Scorecard rating shows how much energy is used throughout your home. Assessments and information are tailored specifically for your home and are delivered by government approved assessors.

A skilled Scorecard assessor will help you to compare your home's energy use with other similar homes and find the best options to reduce your energy bill, protect your comfort and health in summer and winter, and reduce carbon emissions.



renew.

Sanctuary MODERN GREEN HOMES